Claim Listing

Please amend the claims and enter new claims as follows:

1. (canceled)

2. (canceled)

3. (canceled)

4. (canceled)

5. (canceled)

6. (canceled)

7. (canceled)

8. (canceled)

9. (canceled)

10. (canceled)

11. (canceled)

12. (canceled)

13. (canceled)

14. (canceled)

15. (canceled)

16. (canceled)

17. (canceled)

~~19~~18. (currently amended) The apparatus of claim ~~18~~ ~~55-54 or 5655~~, wherein the second electrode comprises a silicon electrode.

~~20~~19. (canceled)

~~21~~20. (currently amended) The apparatus of claim ~~55-54 or 5655~~, wherein the ~~polarizable~~ fluid medium is an electrolyte solution

~~22~~21. (canceled)

~~23~~22. (currently amended) The apparatus of claim ~~18~~ ~~55-54 or 5655~~, wherein the second electrode is the light sensitive electrode.

~~24~~23. (currently amended) The apparatus of claim ~~23~~22, wherein the light-sensitive electrode is patterned by spatially modulated oxide growth, surface chemical patterning or surface profiling, wherein said patterning produces spatial modulation in properties of the second electrode, said properties affecting the local distribution of the electric field at said interface.

~~25~~24. (currently amended) The apparatus of claim ~~24~~23, wherein the modified properties

comprises impedance.

~~26~~25. (currently amended) The apparatus of claim ~~23~~24, further comprising an electric field generator which generates the electric field at the interface and an illumination source for illuminating the interface.

~~27~~26. (currently amended) The apparatus of claim ~~18~~ ~~55~~ 54or ~~56~~55, wherein the second electrode comprises ~~the~~ a planar patterned electrode and wherein the movement of the particles or the liquid medium at the interface is controlled when the electric field is generated at said interface.

~~28~~27. (currently amended) The apparatus of claim ~~27~~26, wherein the second electrode comprises a silicon electrode having a surface and interior.

~~29~~28. (previously presented) The apparatus of claim 27, wherein the surface or interior of the second electrode is patterned by spatially modulated oxide growth, surface chemical patterning or surface profiling, wherein said patterning produces spatial modulation in properties of the second electrode, said properties affecting the local distribution of the electric field at said interface.

~~30~~29. (currently amended) The apparatus of claim ~~27~~28, wherein the modified properties comprises impedance.

~~31~~30. (currently amended) The apparatus of claim ~~27~~26, further comprising an electric field generator for generating the electric field at the interface.

~~32~~31. (currently amended) A method for controlling the movement of a polarizable liquid medium comprising the following steps: providing the apparatus of claim ~~23~~22, wherein the gap between the first electrode and the light-sensitive electrode accommodates a polarizable liquid medium; generating an electric field at the interface between the liquid medium and the light-sensitive electrode; and illuminating the light sensitive electrode with a predetermined light pattern to create fluid flow having a direction substantially parallel to said light-sensitive electrode.

~~33~~32. (currently amended) A method for controlling the movement of a polarizable liquid medium comprising the following steps: providing the apparatus of claim ~~23~~22, wherein the gap between the first electrode and the patterned electrode accommodates a polarizable liquid medium; and generating an electric field at the interface to create fluid flow, said fluid flow having a direction substantially parallel to said patterned electrode.

~~34~~33. (currently amended) A method for controlling the movement of particles suspended at an interface between a polarizable liquid medium and an electrode, said method comprising the

following steps: providing the apparatus of claim ~~23~~22, wherein the gap between the first electrode and the light-sensitive electrode accommodates a plurality of particles suspended in a polarizable liquid medium; generating an electric field at the interface between the liquid medium and the light-sensitive electrode; and illuminating the light sensitive electrode with a predetermined light pattern to produce the movement of the particles.

~~35~~34. (currently amended) The method of claim ~~34~~33, wherein the movement of the particles is in a direction substantially parallel to said light-sensitive electrode.

~~36~~35. (currently amended) The method of claim ~~34~~33, wherein the movement of the particles is in a direction substantially orthogonal to the direction of the electric field.

~~37~~36. (currently amended) The method of claim ~~34~~33, wherein the movement of the particles results in formation of a planar assembly of substantially one layer of particles in a designated area of the light-sensitive electrode, wherein the designated area is defined by the pattern of illumination.

~~38~~37. (currently amended) The method of claim ~~37~~36, wherein the assembly comprises an array of particles.

~~39~~38. (currently amended) The method of claim ~~34~~33, wherein the light-sensitive electrode comprises a silicon electrode.

~~40~~39. (currently amended) The method of claim ~~34~~33, wherein the polarizable liquid medium is an electrolyte solution.

~~41~~40. (currently amended) The method of claim ~~34~~33, wherein the light-sensitive electrode is patterned by spatially modulated oxide growth, surface chemical patterning or surface profiling, wherein said patterning produces spatial modulation in properties of the second electrode, said properties affecting the local distribution of the electric field at said interface.

~~42~~41. (currently amended) The method of claim ~~41~~40, wherein the modified properties comprises impedance.

~~43~~42. (currently amended) A method for controlling the movement of particles suspended at an interface between a polarizable liquid medium and an electrode, said method comprising the following steps: providing the apparatus of claim ~~27~~26, wherein the gap between the first electrode and the patterned electrode accommodates a plurality of particles suspended in a polarizable liquid medium; and generating an electric field at the interface to produce the movement of the particles.

~~44~~43. (currently amended) The method of claim ~~43~~42, wherein the movement of the particles is in a direction substantially parallel to said patterned electrode.

~~45~~44. (currently amended) The method of claim ~~43~~42, wherein the movement of the particles is in a direction substantially orthogonal to the direction of the electric field.

~~46~~45. (currently amended) The method of claim ~~43~~42, wherein the movement of the particles results in formation of a planar assembly of substantially one layer of particles in a designated area of the patterned electrode, wherein the designated area is defined by the properties of the patterned electrode affecting the local distribution of the electric field at the interface.

~~47~~46. (currently amended) The method of claim ~~43~~42, wherein the assembly comprises an array of particles.

~~48~~47. (currently amended) The method of claim ~~43~~42, wherein the patterned electrode comprises a silicon electrode.

~~49~~48. (currently amended) The method of claim ~~43~~42, wherein the polarizable medium comprises an electrolyte solution.

~~50~~49. (currently amended) The method of claim ~~43~~42, wherein the patterned electrode is patterned by spatially modulated oxide growth, surface chemical patterning or surface profiling.

~~51~~50. (currently amended) The method of claim ~~50~~49, wherein the modified properties comprises impedance.

~~52~~51. (currently amended) The apparatus of claim ~~18~~54 or 55 further including means for providing a DC bias voltage between the first and second electrodes.

~~53~~52. (currently amended) The apparatus of claim ~~52~~51 wherein the DC bias voltage is in the range from 1 to 4 V.

~~54~~53. (currently amended) The method of claim ~~32~~31, ~~34~~33 and ~~43~~42 further including the step of providing a DC bias voltage between the first and second electrodes.

~~55~~54. (previously presented) An apparatus comprising first and second electrodes , each having a surface, said surfaces being opposed and positioned to accommodate a fluid medium between said surfaces, wherein the fluid medium ~~which~~ may contain a plurality of polarizable particles, wherein the first and the second electrodes are configured relative to one another so that an electric field is generated within an interface between said fluid medium and at least one of said first or second electrodes when an AC voltage is applied between the electrodes in the presence of said fluid medium, and wherein at least one of said first and second electrodes comprises a light-sensitive electrode capable of controlling the movement of the particles and/or the fluid medium in a direction

substantially parallel to the electrode surface when an electric field is generated within said interface and the light-sensitive electrode is illuminated with a predetermined light pattern.

~~56~~55. (currently amended) An apparatus comprising first and second electrodes, each having a surface, said surfaces being opposed and positioned to accommodate a fluid medium between said surfaces, wherein the fluid medium ~~which~~ may contain a plurality of polarizable particles, wherein the first and the second electrodes are configured relative to one another so that an electric field is generated within an interface between said fluid medium and at least one of said first or second electrodes when an AC voltage is applied between the electrodes in the presence of said fluid medium, and wherein at least one of said first and second electrodes is physically or chemically patterned to distribute an electric field in a predetermined manner in order to control the movement of the particles and/or the liquid medium in a direction substantially parallel to the electrode surface when an electric field is generated within said interface.